Message

From: Davis, Eva [Davis.Eva@epa.gov]
Sent: 11/12/2015 9:48:37 PM
To: d'Almeida, Carolyn K. [dAlmeida.Carolyn@epa.gov]; Wayne Miller [Miller.Wayne@azdeq.gov]
CC: Dan Pope [DPope@css-dynamac.com]
Subject: RE: 2015-11-10 - wafb - FYI - UXO Pro-Praxis comments - ST012 - Steam Injection termination criteria not met

Wayne – the increases/decreases in vapor concentrations aren't shown in the weekly progress reports, but is shown in the slides from the last two meetings/calls. Shows pressure cycling ain't done yet. The graphs of mass recovered vs steam injected are interesting and useful. Eva

From: d'Almeida, Carolyn K.
Sent: Tuesday, November 10, 2015 6:37 PM
To: Wayne Miller
Cc: Davis, Eva; Dan Pope
Subject: RE: 2015-11-10 - wafb - FYI - UXO Pro-Praxis comments - ST012 - Steam Injection termination criteria not met

Wayne

Thanks for this input. These comments go a bit deeper that I intended to go. My intent was not to dispute the data Amec/TerraTherm presented but to use the data they gave us to compare against the established shutdown criteria merely to demonstrate they are not as far along as they think they are. If you want to dispute their data interpretation that would be better done in a separate submittal so as not to confuse the issues.

Carolyn

From: Wayne Miller [mailto:Miller.Wayne@azdeq.gov]
Sent: Tuesday, November 10, 2015 2:01 PM
To: d'Almeida, Carolyn K. <dAlmeida.Carolyn@epa.gov>
Subject: 2015-11-10 - wafb - FYI - UXO Pro-Praxis comments - ST012 - Steam Injection termination criteria not met

FYI

From: Steve Willis [mailto:steve@uxopro.com]
Sent: Tuesday, November 10, 2015 2:54 PM
To: Wayne Miller <Miller.Wayne@azdeq.gov>
Cc: Bo Stewart <bo@praxis-enviro.com>
Subject: 2015-11-10 - wafb - UXO Pro-Praxis comments - ST012 - Steam Injection termination criteria not met

Wayne,

Our comments on EPA's evaluation of the SEE shutdown criteria are as follows:

- Subsurface Temperature (Secondary): The thermocouples utilized in calculating zone averages have changed over time and many readings have proven to be unreliable. Attainment of this secondary criterion is inconclusive.
- Completion of Pressure Cycling (Secondary): Increases or decreases in vapor concentrations associated with pressure cycling are not evident in the data presented. Attainment of this secondary criterion is inconclusive.
- Mass Removal (Primary): Mass removal rates remain well above 10% of approximate peak rates. Significant declines in mass recovery rates are not evident in recent data. Attainment of this primary criterion has not been achieved.

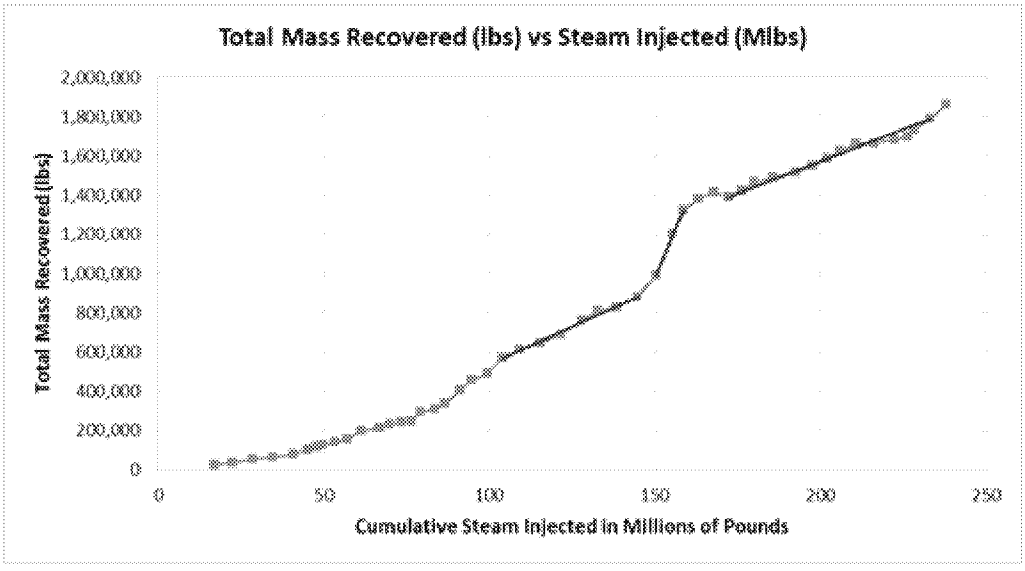
- Benzene Concentrations (Primary): Benzene concentrations remain elevated and above initial values at many locations based on the Weekly Progress Reports. In addition, the current methodology for assessing benzene concentrations is indirect and unreliable. Attainment of this primary criterion has not been achieved.

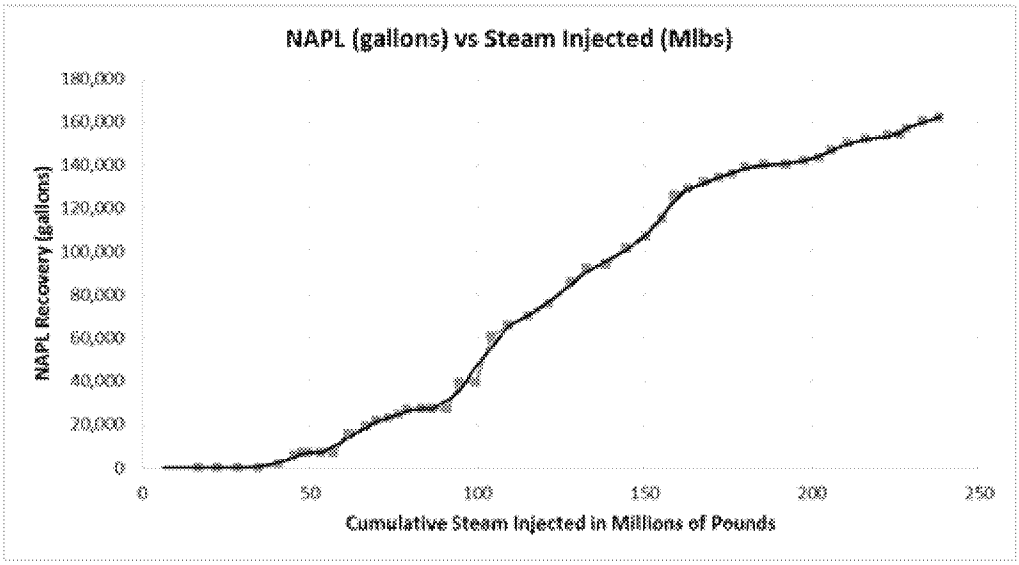
- Steam Injection (Guideline): The targeted total steam injection has not been achieved.

Additional comment on Mass Removal:

The cumulative mass removal plotted in Figure 3 of the Weekly Reports shows an inflection point for a decrease in the rate of mass recovery around June 20th coinciding with the initiation of de-pressurization in the LSZ. The inability to assess mass removal from individual treatment intervals (CZ, UWBZ, LSZ) hampers the evaluation of performance.

The total mass recovery is plotted below as a function of cumulative steam injected instead of date. Steam breakthrough in a number of wells may coincide with the jump in mass recovered between the cumulative steam injection of 150 to 160 Mlbs. However, the rate of mass recovery, illustrated by the slope of the red line, is similar in value before and after the jump in mass recovery. The data do not indicate a significant decay in recovery rate after breakthrough. Similarly, the NAPL recovery alone is also plotted as a function of cumulative steam injected instead of date. The NAPL recovery rate remains relatively steady from 160 million pounds of steam and beyond.





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----- Original Message -----
From: Wayne Miller <Miller.Wayne@azdeq.gov>
To: steve <steve@uxopro.com>
Sent: Tuesday, November 10, 2015 12:03:48 PM
Subject: 2015-11-10 - wafb - anything to add - ST012 - Steam Injection termination criteria not met

Any comments... assume agencies can add more depth/explanation in the future

From: d'Almeida, Carolyn K. [mailto:dAlmeida.Carolyn@epa.gov]
Sent: Tuesday, November 10, 2015 11:00 AM
To: Davis, Eva <Davis.Eva@epa.gov>; Dan Pope <DPope@css-dynamac.com>
Cc: Wayne Miller <Miller.Wayne@azdeq.gov>; steve@uxopro.com; Henning, Loren <Henning.Loren@epa.gov>
Subject: 2015-11-10 - wafb - sto12 - Steam Injection termination criteria not met - cda epa

Eva

Yes, I was thinking I would just forward these notes to AF and Amec, once I had concurrence from all of you - does anyone have anything to add?

From: Davis, Eva
Sent: Tuesday, November 10, 2015 9:27 AM
To: d'Almeida, Carolyn K. <dAlmeida.Carolyn@epa.gov>; Dan Pope <DPope@css-dynamac.com>
Cc: Wayne Miller <Miller.Wayne@azdeq.gov>; steve@uxopro.com; Henning, Loren <Henning.Loren@epa.gov>
Subject: RE: Has criteria for termination of Steam Injection been met?

Hi Carolyn –

I have noted also that AMEC is glossing over the shut down criteria as they are written in the RD/RAWP when they make claims that the criteria have been met. As for their primary criteria of mass extraction rates of 10% of the peak rate, I argued against 10% of the peak extraction rate being used for as a shut down criteria because the percentage is too high – we typically continue treatment to much smaller percentages, and I realized that it would take much more treatment to reach their benzene concentration criteria. Now they are wanting to shut down when they are still at ~ 30% of peak. I thought the benzene concentration range of 100 – 500 ug/l was reasonable – but they aren't even approaching that yet. I was ok with the completion of pressure cycling criteria, but that hasn't been met. I was concerned about the amount of steam injection criteria because I was afraid they would want to immediately shut down when they reached the design steam injection amount, but they want to shut down well before they reach that amount. I recommend that in response to what they have presented to us in the last 2 months, that we supply them with something in writing giving our evaluation of where they are in relation to the shutdown criteria. Your notes are one way that that can be done.

Eva

From: d'Almeida, Carolyn K.
Sent: Monday, November 09, 2015 3:25 PM
To: Davis, Eva; Dan Pope
Cc: Wayne Miller; steve@uxopro.com; Henning, Loren
Subject: Has criteria for termination of Steam Injection been met?

My notes, for your use. Comments?

Carolyn d'Almeida

Remedial Project Manager

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US EPA Region 9

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"Because a waste is a terrible thing to mind..."

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